

### REMARKS

In the Office Action, the drawings are objected to under 37 CFR 1.83(a). The disclosure was objected to. Claim 1 was objected to. Claims 2 and 4 were objected to. Claim 1 was rejected under 35 USC §112, second paragraph. Claims 1-3 and 6 were rejected under 35 USC §102(b) as being anticipated by O'Brian. Claim 4 was rejected under 35 USC §103(a) as being unpatentable over O'Brian in view of Sheets. Claim 5 was rejected under 35 USC §103(a) as being unpatentable over O'Brian in view of Sheets and further in view of Jung et al.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version With Markings To Show Changes Made".

In response to paragraph 3 of the Official Letter, Fig. 3 shows the sheet-like support 1 separately and in Fig. 2 the sheet-like support 1 is between the two most lowest lines. See the enclosed drawing correction, in which (1) has been inserted in Fig. 2.

The present invention relates to a display device consisting of a sheet-like support, covered with a layer of liquid thermocromic crystals, which are separately tempered by an individual power supply to individual heatable elements lying close to the liquid thermocromic crystals and placed between the sheet-

like support and the liquid thermocromic crystals. The liquid thermocromic crystals assume different shades of color dependent on the given temperature so that hereby the color of the liquid thermocromic crystals will form a certain pattern and a figure.

U.S. Patent No. 4,142,782 to O'Brian discloses a display arrangement. The display arrangement includes a sheet-like metallic support provided with areas of different thermocromic compositions. As this display arrangement is heated or cooled the areas will change in color when the temperatures within these areas changes sufficiently to cause a color change. The transition temperatures varies with the thermocromic compound or composition used in those areas.

The display device of the present invention, however, differs substantially from the display arrangement of the O'Brian patent. The inventive idea of the present invention is that the display device may show an arbitrary figure where the design of the figure is formed only by these heatable elements being tempered by heating elements, and which are located according to said design. The inventive idea of the present invention further includes that the support includes a cooling device which is controlled to cool down the liquid thermocromic crystals and/or keep the support of the crystals at a certain temperature, which is lower than the temperature at which the liquid thermocromic crystals are colored. It is thereby possible to very quickly change from one arbitrary

figure to another arbitrary figure. The present invention further allows a very sharp figure since the temperature of the support can be kept at a certain degree irrespective of the surrounding temperature, and thereby keep all the liquid thermocromic crystals that does not constitute part of the figure at a certain color. This is not accomplished in the O'Brian patent.

According to the O'Brian patent, the design of the figures will appear in accordance with the location of the thermocromic crystals. The thermocromic crystals, however, are located in different, specific areas in specific patterns as can be seen from the figures. Thus, it is only possible to shift from one figure to a different figure in dependence of the particular pattern of the thermocromic crystals on the metallic support. These patterns thus substantially limit the kinds of figures that may be presented on the display arrangement. For example, in fig. 4, of which fig. 5 constitutes a partial cross sectional view, the display arrangement includes a support having a surface which carries elongated striplike electrical resistance elements. The resistance elements are covered by areas of various thermocromic crystal compositions. The areas of thermocromic crystal compositions however, are as can be seen in the figures only present on the elongated striplike resistance elements. Thus the kinds of possible figures are considerably limited.

In conclusion, the O'Brian patent does not disclose a display device where the liquid thermocromic crystals are distributed over a complete layer covering the support and without a specific pattern, where the design of the figure is determined only by tempering the small heatable elements which are located according to said design, and where the support includes a cooling device that is controlled to cool down the liquid thermocromic crystals and/or keep the support of the crystals at a certain temperature, which is lower than the temperature, at which the liquid thermocromic crystals are colored. The advantages of the present invention over what the cited references teach are stated on page 4, from line 24 to the end of the specification.

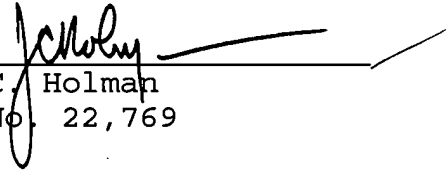
Based on the foregoing amendments and remarks, it is respectfully submitted that the claims in the present application, as they now stand, patentably distinguish over the references cited and applied by the Examiner and are, therefore, in condition for allowance. A Notice of Allowance is in order, and such favorable action and reconsideration are respectfully requested.

However, if after reviewing the above amendments and remarks, the Examiner has any questions or comments, he is cordially invited to contact the undersigned attorneys.

Respectfully submitted,

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Date: March 6, 2003  
JLS/dmt

Serial No. : 09/529,401  
Atty. Docketing No. : P65317US0

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the specification as follows:

Please insert the following paragraph on page 1, before  
line 3.

--Field of the Invention--

Please insert the following paragraph on page 1, before  
line 12.

--Background of the Invention--

Please insert the following paragraph on page 2, before  
line 15.

--Summary of the Invention--

Please insert the following paragraph on page 2, before  
26.

--Brief Description of the Drawings--

Please insert the following paragraph on page 2, before  
line 34.

--Detailed Description of the Preferred Embodiments--

Please replace the paragraph beginning at page 3, line 22 with the following rewritten paragraph.

-- The thermocromic crystals are covered by a coating of lacquer 5 in order to protect the crystals ~~to~~ from the surroundings, the composition of said coating of lacquer being stated later. --

Please replace the paragraph beginning at page 4, line 1 with the following rewritten paragraph.

-- This is illustrated in fig. 3 by that the sheet-like support 1 has one or several continuous channels or is designed like a jacket so that the sheet-like support is ~~hallow~~ hollow whereby a cooling medium 4 can pass through the sheet-like support and keep it at a constant temperature or lower the temperature for the complete display device. --

**IN THE ABSTRACT:**

Please amend the Abstract of the Disclosure as follows.

-- **ABSTRACT OF THE DISCLOSURE**

A known display device consists of a sheet-like support ~~(1)~~ which is covered with liquid therochromic crystals ~~(2)~~. ~~These~~ The crystals are tempered by individual power supply to individual heatable elements ~~(3)~~, which lie close to the crystals and are placed between the sheet-like support ~~(1)~~ and the crystals ~~(2)~~. The crystals assume different shades of colour dependent on the

given temperature so that hereby the colour of the crystals will form a certain pattern. In order to improve the possibilities to control the tempering of the individual crystals and also protect them from being effected by the ambient temperature and from mechanical damage, the crystals have an underlying ~~means~~ (4) arrangement which ~~are~~ is controlled to cool down th crystals (2) and/or keep the sheet-like support (1) of the crystals at a certain temperature. This temperature is lower than the temperature, at which the crystals are coloured. Further the crystals are covered by a coating of lacquer over the complete sheet-like support.

**IN THE CLAIMS:**

Please cancel claim 6 without prejudice or disclaimer.

Please amend claims 1-5 as follows:

1. (Amended) Display device ~~consisting of~~ comprising:  
a sheet-like support (1) ~~which is~~ covered with a layer of liquid thermocromic crystals (2), ~~which are~~ the liquid thermocromic crystals being separately tempered by an individual power supply to individual heatable elements (3), ~~which lie~~ the individual heatable elements being close to the liquid thermocromic crystals and ~~are being~~ placed between the sheet-like support (1) and the liquid thermocromic crystals (2), ~~whereby~~ the liquid thermocromic crystals ~~assume~~ assuming different shades of ~~colour~~ color dependent on the



a given temperature so that ~~hereby~~ the ~~colour~~ color of the liquid thermocromic crystals will form a certain pattern and ~~hereby~~ a figure ~~characterized by that~~, the liquid thermocromic crystals (2) ~~are being~~ distributed over ~~the~~ a complete layer without a specific pattern and ~~that the~~ a design of the figure ~~is being~~ determined only by tempering the ~~small~~ individual heatable elements (3), which are located according to said ~~wanted~~ design, and ~~by that the~~ support includes a cooling means (4) which are device controlled to cool down the liquid thermocromic crystals (2) ~~and/or keep the~~ support (1) of the crystals at to a certain temperature, which is lower than the given temperature, ~~at which the crystals are coloured and whereat the liquid thermocromic crystals are being~~ covered by a protective coating.

2. (Amended) Display device according to claim 1, ~~characterized in that the underlying means consists~~ wherein the individual heatable elements consist of peltier elements, ~~which are black and are~~ supplied by electricity ~~in order~~ to set their temperature.

3. (Amended) Display device according to claim 2, ~~characterized in that~~ wherein the liquid thermocromic crystals are painted on the peltier elements.